PERSONNEL IN INDUSTRY.

By

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Approved:_____
Department of Engineering.

Date.

Source of Information.

The information contained in this thesis shows the progress being made in Personnel Work at the factory of the Westinghouse Electric & Manufacturing Company at East Pittsburgh,Pa., where the writer spent 2 years devoting the greater part of his time to the study and revision of the phases of Personnel Work outlined in the following report.

Preface

The word "Personnel" as related to industry includes everything that has to do with or effects in any way the individual welfare or output of the employee, his working conditions, working hours, rates of pay, and supervision.

The character and development of personnel work in any industry is governed to a large extent or almost wholly by the size of the industry. It is obvious that in plants with few employees, where each employee is in close contact with the owner or manager, that no broad scope of personnel work is necessary. However when a factory reaches the size where it's employees number into the hundreds and thousands the need for a distinct personnel program is apparent.

In some modern industries where the number of employees has reached 10,000 or more, we find a Vice-President or Director of Personnel, whose authority and position in the Organization, is equal to that of the Vice-President of Sales, the Vice-President of Manufacturing, or the Comptroller. The organization chart on page (2) shows such an organization. Such an organization is as yet a comparatively new one, but it is one to which practically all large modern industries will look forward to as their needs for personnel work are supplied.

Some of the phases of personnel work which the larger industrial concerns are most vitally interested in are; employment problems, transfer of employees, Americanization work, educational work, rating of employees, standardization of occupations and rates, job analysis, relief and compensation, social and welfare work among employees including cafeterias and dining rooms, band concerts, and athletics,

Because of the broad field embraced in personnel work only the following phases will be considered in this treatise: the"Standardization of Occupations & Rates", "Job Analysis", and "Rating of Employees".

Any phase of personnel work is worth while in the eyes of the Management only insofar as the ultimate quantity and quality of the apparatus manufactured is concerned. Consequently the central idea of this paper will be to show the influence of personnel work as related to shop production. In order to do this it is necessary to bear in mind the relation that exists between the morale of the employee and the output he produces. Because in the

final analysis, the morale or spirit of loyalty of the employee, depends upon shop activities, working conditions, hours of work, rates of pay, and supervision, all of which are the more importantfactors in determining whether the employee is exerting his maximum productive effort.

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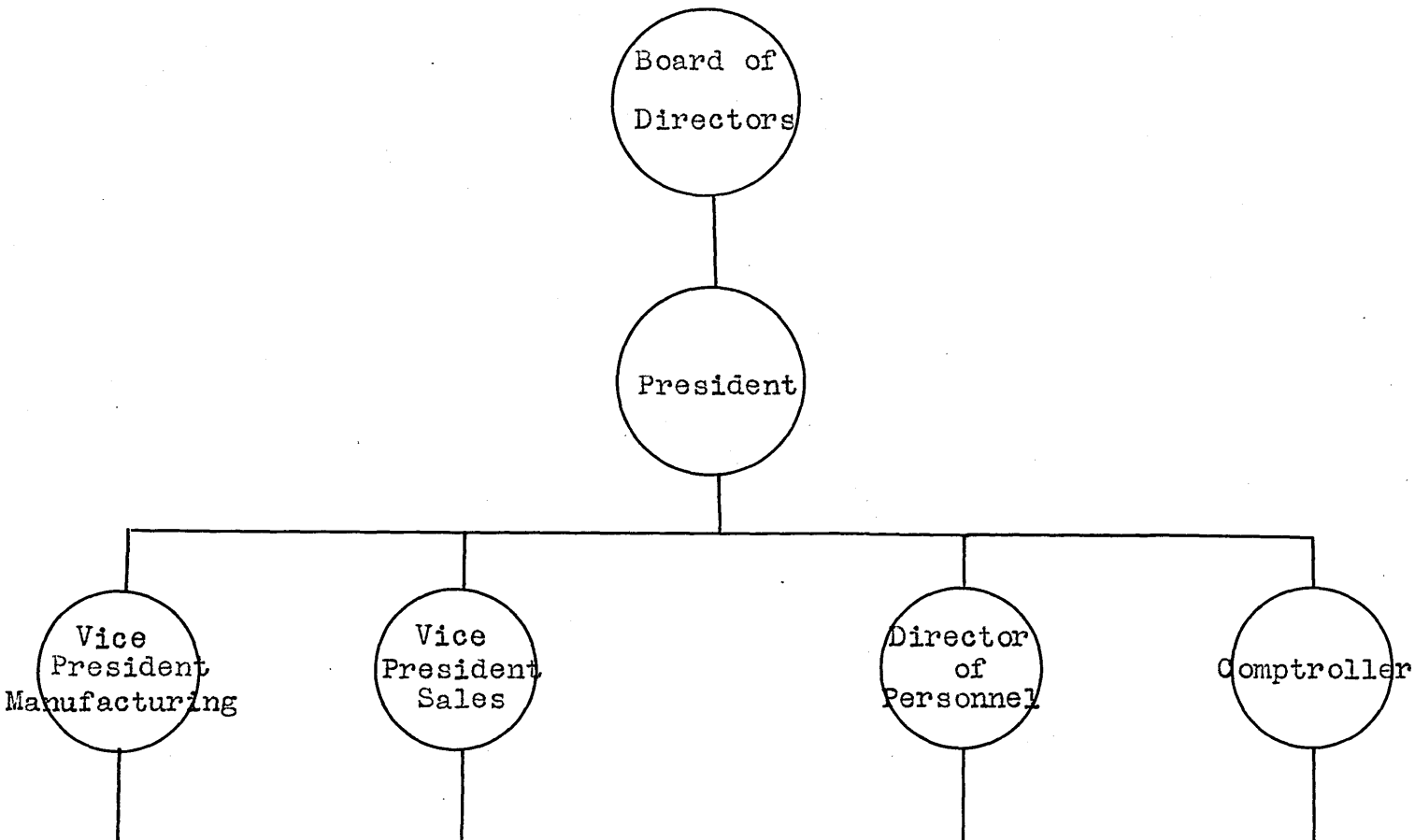
Introduction

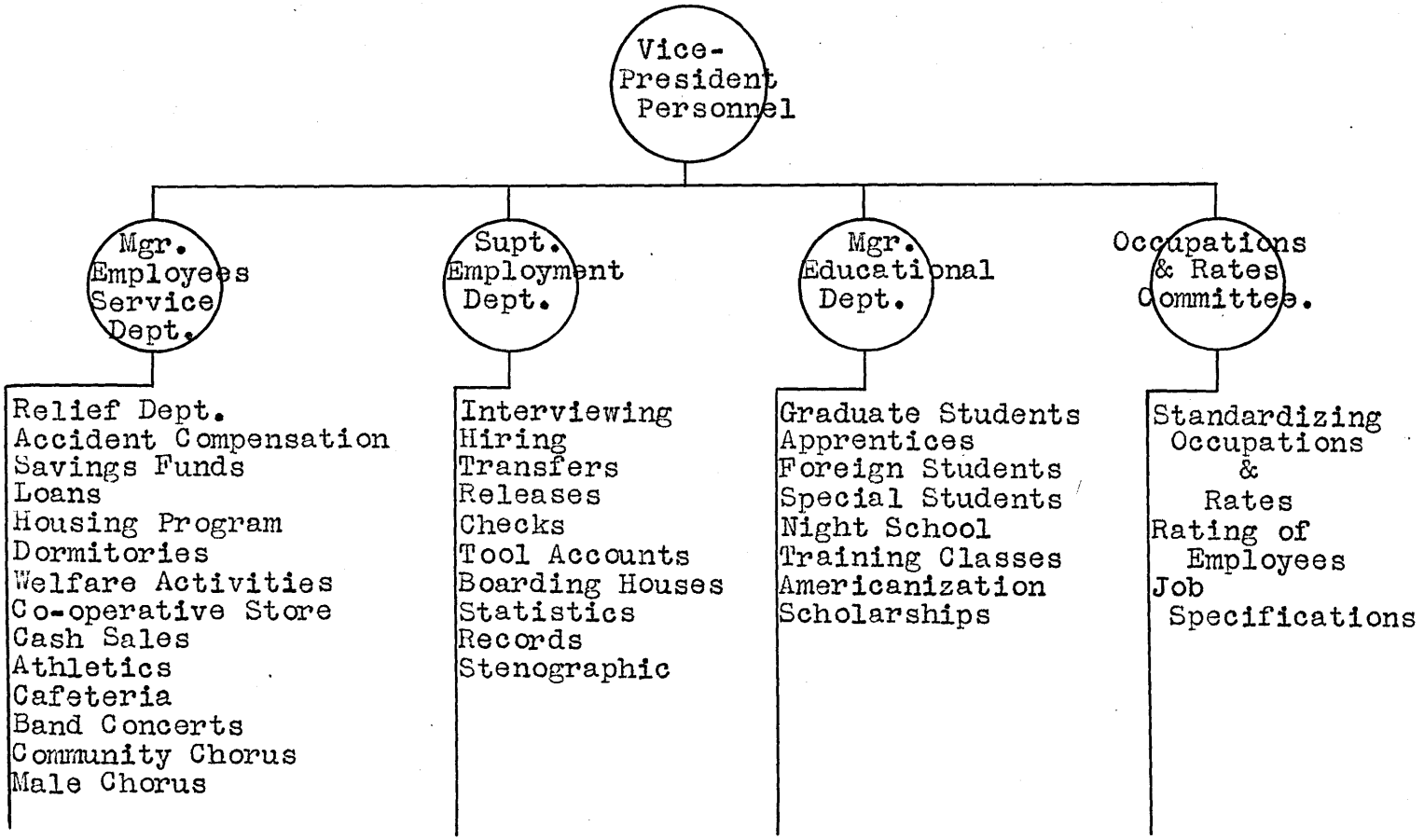
Probably no other branch of modern industry was so greatly effected by the recent world war as that of the manufacturing industry. This was only natural as the burden of production fell upon the manufacturing industry. The success of the war favored the side which could place properly equipped soldiers in the field within the shortest period of time. To do this it was not only necessary to furnish munitions, food, clothing, and other supplies, but it was even more urgent to furnish means of transportation for men and supplies.

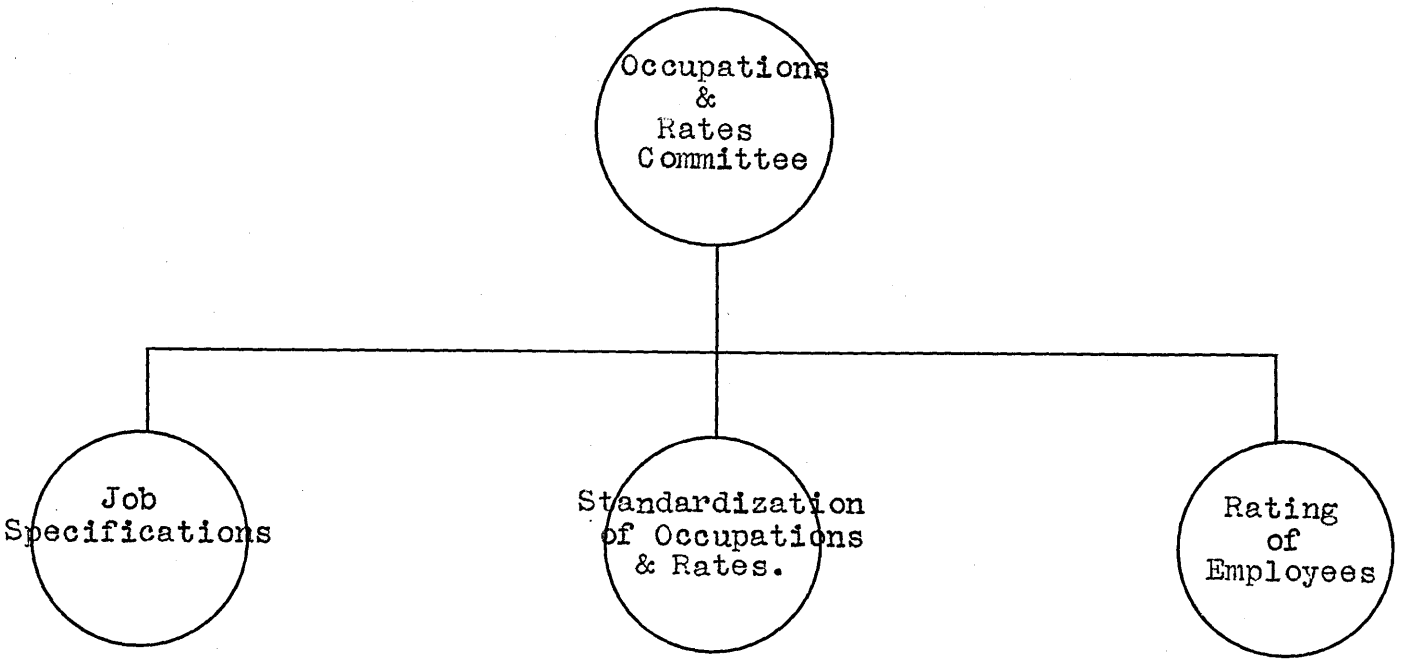
Manufacturers were called upon almost over night to furnish every conceivable form of war supplies within a very limited time and to manufacture and provide apparatus for the transportation of such. As thousands of industries plunged into this gigantic task they were continually called upon to accelerate production. This necessary demand for increased production fell upon the manufacturer in the face of an ever decreasing man power in industry, which was counteracted somewhat by the removal of men from non-essential industries and the placing of them in essential industries. But in spite of everything that could be done the industrial world was confronted with enormous problems.

The solution of these problems confronting the manufacturer necessitated in many cases, an almost complete revision of manufacturing methods so as to give the greatest returns for the energy expended. The ever increasing cost in living brought about by conditions resulting from the war made necessary continual changes in working conditions, hours of work and rates of pay. The necessity for proper morale and a spirit of good feeling between the management and their employees was never greater than at this time. Employers were quick to learn the great extent to which increased production depended upon a satisfied and contented employee. Employees could no longer be treated as a commodity or machine but as individual human beings.

At this stage the industrial engineer came to the immediate foreground and established himself firmly in connection with personnel work, which proved to be one of the greatest and most necessary problems for the manufacturer to solve.


Board of Directors
President
Vice President Manufacturing
Vice President Sales
Director of Personnel
Comptroller


Vice-President Personnel
Mgr. Employees Service Dept.
Relief Dept.
Accident Compensation
Savings Funds
Loans
Housing Program
Dormitories
Welfare Activities
Co-operative Store
Cash Sales
Athletics
Cafeteria
Band Concerts
Community Chorus
Male Chorus
Supt. Employment Dept.
Interviewing
Hiring
Transfers
Releases
Checks
Tool Accounts
Boarding Houses
Statistics
Records
Stenographic
Mgr. Educational Dept.
Graduate Students
Apprentices
Foreign Students
Special Students
Night School
Training Classes
Americanization
Scholarships
Occupations & Rates Committee.
Standardizing Occupations & Rates
Rating of Employees
Job Specifications


Occupations
&
Rates
Committee
Job
Specifications
Standardization
of Occupations
& Rates.
Rating
of
Employees

The Standardization of Occupations & Rates.

At the beginning of the war the Westinghouse Electric & Manufacturing Company, the Westinghouse Machine Company, the Westinghouse Airbrake Company, the Union Switch & Signal Company, the R.D.Nuttall Gear Company, and other subsidiary Westinghouse plants, all located in the Pittsburgh district and operating under the same Board of Directors, were called upon to furnish vast quantities of war supplies. As these allied companies began to direct between 90 and 100 per cent of their energy toward the production of war supplies, it was very necessary to have a complete understanding and control over their personnel.

This fact was very vividly realized when it became apparent that large numbers of employees were floating back and forth from one company to another. This unnecessary large labor turnover was caused by the fact that some of these companies were paying bigger wages than others for identical kinds of work. In order to obtain better co-operation, which was the crying need of the hour, it became apparent that a stop must be put to this competition for employees, between these various companies. In order to do this the first step necessary was to standardize wages paid within the various plants. Before this could be done it was necessary to standardize occupations in the various factories, so as to have common terms to deal with at meetings of representatives from the various companies.

At this point the Westinghouse Electric & Manufacturing Company began a large program for the standardization of occupations and rates which covered a period of several years development. The completeness with which this work was done has made the Westinghouse Electric & Manufacturing Company a pioneer in this phase of personnel work, as the Company is far ahead of any other industrial organization in this kind of work.

The standardization of occupations and rates proved to be a stepping stone towards even greater personnel work which has culminated in the analysis of every job in the entire factory and a well-defined system of periodically rating each individual worker in the employ of the company. These phases of the work will be discussed in the order in which they were worked out and installed.

During the past few years industry has grown to such an extent that it has demanded standardized methods, materials and machines. Along with this growth has also come the demand for centralized employment of workers, which has created a necessity for standard conditions concerning the workers.

The need for standardizing occupations and rates within the factory of the Westinghouse Electric & Mfg. Co. can be more readily understood if a more general knowledge of the Works Organization is known. The plant of the Westinghouse Electric & Mfg. Co. at East Pittsburgh,Pa. is made up of 16 different departments, each department being practically a distinct factory having it's own superintendent. Each one of these departments is devided into sections having a foreman over each one. All the department superintendents report to the Works Manager.

Some of the different departments have occupations just alike. Heretofore, it was not unusual to find employees doing the same kind of work but being paid different rates, the superintendent of each department determining the rates to be paid the employees under him. Consequently, when an employee in one department discovered that he could get more money by doing the same kind of work in another department he immediately applied to the employment department for a transfer. This procedure caused a large labor turnover among the various departments throughout the works and thus was a handicap toward establishing an efficient and permanent departmental working force.

It also was a very common occurrence to find employees having the same qualifications and doing the same class of work, but receiving different rates of pay. Such conditions as these were unfair to the management and unfair to the employees as it created a discontented and restless feeling among the workers.

It was to obliviate such conditions as these that the standardization of occupations and rates was undertaken, the central thought being to accomplish the attainment of the following ideals.

1.Uniform rates of pay for uniform service.

2.A certain range of wages for each occupation.

3.A system for facilitating promotion of employees.

In order to effect this work two essential steps were necessary.

1. The selecting of standard names or occupations for the various kinds of work.

2. The classification of workers as regards their value to the industry, regardless of occupation.

The first step in securing a standard list of occupations,** which would apply to the entire factory, was to visit each section and department separately and make a detailed study of the different operations in that particular department. These operations were noted and studied very carefully after which a list of occupations was compiled which covered every phase of work done in the entire factory. The definite occupational names chosen in each department were submitted to the department superintendent for his approval before being sent to the Occupations & Rates Committee for final approval. The first list of occupations numbered approximately 400, but after considerable study and revision was reduced to less than 200, The final list of occupations was known as the list of standard occupations for the plant of the Westinghouse Electric & Manufacturing Company.

Each occupation was assigned a standard number and within a very short time each occupation and it's corresponding number had become so correlated with each other that one could often be substituted for the other. However in all cases the number and occupation could be used as a check against each other and thus serve as a means of preventing mistakes.

(Note**) This work was carried out and developed by technical trained engineers whose work was carefully supervised and approved by a committee composed of the General Superintendent of the Westinghouse Electric & Mfg. Co., the Superintendent of the Employment Department, the Ass't. Superintendent of the Rate Department and a couple department Superintendents who had devoted their entire lives toward familiarizing themselves with the different types and kinds of industrial work.

The list of names of the standard occupations follow:

Standard Occupations.

1. Auto Truck
2. Automatic Sleeve Machine
3. Babbitter
4. Balance, Running
5. Balancer, Static
7. Bander, Rotor
84. Battery Repairman
8. Belt Maker
9. Blacksmith
10. Blacksmith, Helper
12. Boiler Cleaner
11. Boiler Maker
17. Bolt Forging Machine
16. Bolt Pointing Machine
15. Bolt Threader
13. Boring Mill, Horizontal
14. Boring Mill, Vertical
20. Box Maker
21. Box Marker
18. Assistant Foreman
26. Brazier
22. Bricklayer
25. Buffer
165. Bull Block Man
24. Bull Dozer
27. Cabinet Maker
28. Carpenter
30. Centering Machine
32. Chauffeur
29. Checker, Car
31. Checker, Materials
23. Chipper
33. Coil Assembler
34. Coil Winder
40. Coiling & Bending Copper
35. Coils, Form and Pull
19. Connector
39. Coppersmith
36. Core Builder
37. Core Maker
38. Corrugating Press
42. Coslettizer
43. Craneman
44. Cutting Off Machine
45. Cutting Off Saw
46. Die Casting Maker
47. Die Maker
163. Draw Bench
49. Drill Press
164. Edging Machine
50. Electrode Maker
52. Elevator Man
51. Elevator Man, High Speed
53. Emery Wheel Dresser
54. Enameling
55. Engineer, Stationary
59. File Cutter
60. File Sharpener
58. Filer
64. Fitter
62. Former, Hand
63. Furnace Man
65. Galvanizer
66. Gear Cutter
67. Grinder
69. Hammerman, Bradley
71. Hammerman, Drop
70. Hammerman, Steam
73. Hammer Operator
68. Handyman
172. Heaterman
74. Helper, Machine
75. Hoop Rolling Machine
57. Hostler, Railroad
173. Ingot Machine
79. Inspector, Equipment
80. Inspector, Production
81. Instrument Maker
61. Insulator
87. Lamp Trimmer
88. Lathe, Engine
89. Lathe, Turret
90. Layerout
82. Locomotive, Electric
94. Machine Tool Setter
174. Machinist Journeyman
92. Marble Driller
93. Marble Enameler
91. Marble Worker
95. Material Cutter
97. Mica & Composition Worker
98. Micarta Worker
96. Milling Machine
99. Millwright

102.Motor Tender
100.Mould Setter
104.Moulder,Bench
105.Moulder,Floor
103.Moulder,Machine
101.Moveman
107.Oiler
108.Packer
111.Painter
110.Pattern Maker,Metal
109.Pattern Maker,Wood
112.Pipe Fitter
113.Planer
114.Plater
115.Plumber
116.Polisher,Metal
77.Press,Hydraulic or Pneumatic
78.Pumpman
118.Punch Press
161.Repairman
119.Rigger
120.Riveter
167.Roller,Cold
166.Roller,Hot
168.Rougher
6.Saw;Band or Circular
121.Saw Filer,Hand
122.SAw Filing Machine
124.Screw Machine,Automatic
123.Screw Machine,Hand
125.Set up for Test
76.Sewing Machine
126.Shaper
127.Shearman
128.Sheet Metal Worker
171.Shipper
129.Sign Writer
130.Slater
170.Slitting Machine
131.Slotter
132.Solderer,Pot
133.Spring Maker
135.Stockman
137.Stoker Operator
136.Storeroom Attendant
169.Straightener
138.Structural Iron Worker
106.Switchboard Mounter
139.Switchboard Operator
83.Switchman,Industrial
160.Taper
175.Tester,Electrical
140.Tester,Mechanical
141.Tinner
142.Tinsmith
146.Tool Dresser
143.Tool Handler
145.Tool Maker
144.Tool Temperer
148.Trackman,Railroad
149.Transformer Mounter
147.Treat,Dip & Insulate
150.Undercut Commutator
85.Unskilled Workman
Ashman
Coal Handler
Coil Separator
Freight Handler
Hook on Crane
Janitor
Lumber Handler
Magnetic Separator
Material Handler
Millwright Helper
Oil Separator & Washer
Pickler
Pipe Fitter,Helper
Plumber,Helper
Sand Blast Operator
Sheet Steel Handler
Slater,Helper
Stoker,Oiler
Sweeper
Trucker
Wiper
151.Water Tender
155.Weigher
152.Welder,Arc
153.Welder,Butt or Spot
154.Welder,Oxy-Acetylene
159.Winder
158.Wireman,Apparatus
157.Wireman,Shop
156.Wood Working Machine

The Classification of workers according to their value to the industry involved considerable study and a thorough knowledge of the qualifications and skill required for each particular occupation. This was a very particular and responsible part of the work, because upon the classifications made, depended the relative rates of pay which would be received by the different classes of workmen. This work was made more difficult, because rates of pay had to be adjusted to conform with the classification, in cases where an employee's rate of pay exceeded the range of rates established for that class of work.

Five classes of work were established to cover all the work in the industry, the qualifications of each class being different. A certain range of rates was allowed for each class of work, so that all employees receiving practically the same rate would be rated in the same class as workmen. The range of rates allowed for each class conformed very closely with the prevailing rates being paid occupations which had been placed in that particular class.

The five classes of work established were known as Classes A, B, C, D, and E, each class having, in general, the following qualifications.

(Class A) Employees on experimental work, tool makers, group leaders, and workers engaged on high class production work. A general knowledge of machine operations, tools, speeds, materials,etc., is necessary, also good judgment and accuracy without the use of jigs are required.

Examples A. Boring mill and planer operators on large work, where mistakes and errors would cause great loss.

(Class B) Accurate, dependable and experienced workers without the thorough knowledge required of those in Class A. Workers on large and heavy repetition work. A knowledge of speeds and materials, reading of blue prints and gages are required.

Examples B. Planer operators on medium-sized repetition work. Engine lathe operators on laborious, but not especially difficult work.

(Class C) Proficient workers on repetition work.

Examples C. Planer operators on rough work. Boring mill operators on small repetition work.

(Class D) New employees who have had very little experience but who will soon become efficient workers on kinds of work which are usually repeated.

Examples D. Employees learning to operate drill presses and milling machines, learning winding,etc.,

(Class E) Unskilled workmen doing ordinary laboring work where no knowledge or skill is required.

Examples E. Sweepers, truckers, janitors, material handlers and helpers.

After this classification had been completed, all the occupations in the shop were tabulated, showing the range of rates allowed for each. From this information two sets of books were compiled, the foreman's book and the superintendent's book. Each foreman was given a book (Page 12) showing the occupations in his particular section and the range of rates he was allowed to pay for each occupation. The superintendent's book (Page 13) showed the total number of sections using each occupation and the rates authorized for each. From this book he could immediately obtain a comparison between the rates paid for a certain occupation in his department and the rates paid for the same occupation in another department.

A range of rates was allowed for each class so as to provide for normal increases, such as for increased efficiency and longer service. The minimum rate authorized for an occupation is generally used as the maximum hiring rate; the higher rates being used as the employee becomes more skilled in his line of work. When an employee reaches the top for his class he is then eligible for promotion to the next higher class. When an employee reaches the top of the highest class authorized for his occupation, in order for further promotion, he must then be transferred to another section having more difficult work on that same occupation; or he may be transferred to a new occupation which authorizes a higher classification.

A key sheet is furnished with each rate book, both foreman's and superintendent's, showing the range of rates allowed for each class. Incase of a general raise where the rates are changed indepndent of the classification, a new key sheet will suffice for each rate book, thus making a very flexible arrangement for revising the rates.

DEPARTMENT_____ SECTION____

	OCCUPATIONS	Classes authorized for this Section									
		Men					Women				
		A	B	C	D	E	A	B	C	D	E
14	Boring Mill, Vertical			x	x						
49	Drill Press				x	x					
64	Fitter		x	x	x	x					
88	Lathe, Engine		x	x	x						
89	Lathe, Turret		x	x	x						
94	Machine Tool Setter	x									
101	Moveman				x	x					
131	Slotter		x	x	x						
85	Unskilled Workman										
	Material Handler					x					
	Sweeper					x					
	Trucker					x					
159	Winder				x	x					

Sample Page from Foreman's Book

OCCUPATIONS & CLASSES

Occ. No.	Occupations	Class	Authorized Sections					
116	Polisher, Metal	C	I-40					
		D	I-40		M-1			
		E	K-72					
77	Press, Hydraulic	B	H					
		C	A-4	A-5	B-3	C-3	H	
			T-5	TC-1				
		D	A-3	A-5	B-3	C-3		
			T-1	T-3	T-5	T-6		
		E	E-7	F-3				
78	Pumpman	C	P-70		P-80			
		D	P-70		P-80			
118	Punch Press	C	G-1	G-2	G-3	G-4		
			G-5	G-6	G-7	G-8		
		D	G-1	G-2	G-3	G-4		
			G-5	G-6				
161	Repairman	A	F-2	O-4	D-2			
		B	F-2	O-4	D-2	E-5		

Sample Page from Superintendent's Book

The superintendent's book shows the sections that use each occupation and the corresponding classification allowed in each section.

JOB ANALYSIS AND JOB SPECIFICATIONS.

For highly successful Centralized Employment, standardization was the fundamental principle. After having standardized the occupations and classified them according to rates of pay, the next step was the analysis of each particular job in the shops.

A Centralized Employment Department, as maintained by the Westinghouse Electric & Manufacturing Company, was called upon to hire between 15,000 and 25,000 employees every year. This Centralized Employment Department was a small organization within itself, consisting of approximately 50 people reporting directly to the Superintendent of the Employment Department, who in turn reported to the Works Manager. Each member of this organization had been chosen as being especially adapted for the work they were required to do.

The Employment Department was divided into three divisions, the men's division which hired all male employees, including boys, unskilled, semi-skilled, skilled and clerical employees,; the girl's division which hired all girls on manufacturing work; and the women's clerical division which hired all female clerical workers for the various office organizations. Each branch of the Men's division was in charge of a separate interviewer.

It was obvious that in a factory the size of the Westinghouse factory that no interviewer could have an intimate knowledge of more than a certain limited number of the various shop jobs. And yet this intimate knowledge of each particular job in the shop was desired of the interviewer so that he could better use his discretion and judgment in the interviewing and selecting of workers. The management not only wished to place the new employee on the kind of work he desired and was best fitted for, thus preventing a lot of future dissatisfaction; but the employee expected a description of the character of the work on which he was going to be placed. The more informationthat could be placed at the desk of the interviewer, the more capable he was to make an intelligent selection of workers. It has been proven time and time again that the quickest way to build up a permanent and efficient manufacturing organization is to have an efficient and intelligent employment organization.

It was with this thought in mind that the analysis of shop jobs was undertaken, so as to give the interviewing force a ready, easily accessible, compact form of information to be used as a valuable asset in carrying on their work.

In order to be of greatest service to the Employment Department in selecting proper workers and to the shop foremen in receiving proper workmen, the analyzation of shop jobs and the writing of shop job specifications involved two fundamental things:

1. A description of the job.

2. A description, as nearly as practical, of the most ideal worker for each job.

This information, in order to be of practical use, had to be in very simple and compact form, occupying as little space as possible. The most practical means of compiling and using this information seemed to be a card index system. On one side of this card it was decided to have a description of the job and on the other side a description of the type of worker desired for the job.

The first thing to be done was to design a standard card for compiling the results of the analysis made. On page (18) is shown the design of the standard 4"x6" card which was accepted and approved for this work. Many suggestions were made as to the information this card should contain and a great deal of study and discussion was carried on before the final card was accepted.

It was obvious that the following information should be on each job specification card:, job number, department, division, section, occupation, occupation number and class.

The method for most easily describing the worker was arrived at as follows: A list of the most common and important mental and physical qualifications by which an employee is judged, in relation to his work, was made up and compiled. From this list was chosen the most practical qualifications that could be easily and quickly determined. These qualifications appear on the job spcification card.

The various factors and terms that enter into the description of the work were chosen after much deliberation. Just the most important descriptive terms, that would in any way effect the type of worker selected, were used as descriptive of the work. These terms were

chosen over a broad field with the idea of securing a large enough variety of standard terms, from which the essential characteristics could be obtained of any job in the entire factory. The method of wage payment was also taken into consideration, because many employees express a preference as to the system of wage payment desired; also certain systems of wage payment are specially adapted to certain kinds of work. Other items accounted for on the card included the type of machine tool and the kind of materials used on the work.

With the job specification card designed and printed, the work of job analysis was begun. This involved a detailed analysis of each occupation, each occupation usually including several jobs. For example, a Class A engine lathe operator might be operating on very large work requireing a great amount of skill and experience; a Class C engine lathe operator might be doing repetition work such as roughing shafts,etc.. These two operators are both working on the same occupation "Lathe,Engine", but the two jobs are distinctly different. In general, different Class operators on the same occupation would be doing different jobs; a difference in Class usually signifying a difference in the nature of the work.

The work of analyzing the different jobs was done with the close co-operation of the shop foremen. This was very desirable, as the foreman's knowledge of the work and his experience in handling men, ably qualified him for describing the type of worker desired. The foreman was the man that the Employment Department wished to please so it was importment that he have a part in specifying items and characteristics recorded on the job specification cards. The cards were sent to the Superintendent of each Department for final approval.

This work was carried on for almost a year , covering one section at a time, until fully completed. The approximately 200 occupations had been divided up into over 3,000 separate jobs, with a separate job specification card for each job. Three sets of these cards were printed, one set for the Employment Department, one set for the Occupations & Rate Committee, and one set was divided among the shop foremen, each foreman receiving the cards that applied to the jobs in his particular section.

The cards were filed in section order, the cards in each section being filed by consecutive job numbers. By this system of filing, the card for any job in the factory could be quickly pulled from file.

The method of using the cards was thus made very simple. When the forman in any section of the factory desired an employee for a particular job, he would forward to the Employment Department a form, "Requisition for Help Required" giving the job number. The interviewer would immediately pull that job number and he would have a complete description of the job, giving him the information desired.

A job specification card was also designed and job specifications written for the women office employees. This work was carried on similar to that within the shop, except that clerical occupations were studied together with the qualifications of clerical workers.

(Note). Introducing and installing new personnel methods of any material scope required considerable personality and tact on the part of the management and the workers engaged in the work. It was in this respect that the industrial engineer met these problems in a satisfactory manner, both to the management and the employees.

The foremen and the men under them had to be educated to these new methods and made to feel that this work was being done for their ultimate and mutual benefit. The co-operation of everyone was necessary for the successful installation of any new system or methods.

JOB SPECIFICATION WORKS EMPLOYEES

Job No._____

Dept._____Div._____Sec_____

Occupation_____No._____Class_____

THE WORKER:-

Age Limits_____Minimum Weight_____

☐ Man	☐ Speak English	☐ Strong	☐ Accurate	☐ Use Jigs
☐ Woman	☐ Read English	☐ Quick	☐ Thorough	☐ Gauges
☐ Tall	☐ Write English	☐ Deliberate	☐ Good Memory	☐ Templates
☐ Medium	☐ 6th Grade	☐ Patient	☐ Read Scale	☐ Micrometer
☐ Colored	☐ 8th Grade	☐ Observant	☐ Set Up Work	☐ Prints
☐	☐ Apprentice	☐ Careful	☐	☐

Tools Operative Should Own_____

Experience (Time) Previous_____To Learn_____How Taught_____

Promote From_____To_____

Remarks_____

Front Side (Job Specification Card)

THE WORK:-

☐ Heavy	☐ Standing	☐ Hot	☐ Fumes	☐ Day Work
☐ Light	☐ Sitting	☐ Cold	☐ Oils	☐ Premium
☐ Close	☐ Stooping	☐ Wet	☐ Acids	☐ Piece Work
☐ Rough	☐ Reaching	☐ Dirty	☐ Hard for Hands	☐ Standard Time
☐ Hand Lift	☐ Repetition	☐ Dusty	☐ Eye Strain	☐ Group
☐ Crane Lift	☐	☐	☐	☐ Task

Approximate number engaged in this work: Men_____ Women_____

Type of Machine Tool_____

Materials Used_____

Description of Work_____

_____

_____

_____

Reverse Side (Job SpecificationCard)

Rating Employees

The policy of the Westinghouse Electric & Manufacturing Company has been to fill all higher positions and jobs by the promotion of present employees. Such a policy is one of the greatest incentives toward building up a large and stable organization and it's results are shown by the fact that the Company has a Veteran Employees' Association with a membership approximating 1,000 employees, each member having had over 20 years service with the Company.

In order to better apply such a policy of promotion toward shop employees, it seemed advisable to have some standard and logical system of grading and rating employees. For such a system to be successful there must be some easy way of grading each employee, these relative grades determining an employee's eligibility for an increased rate, transfer or promotion. The standardization of man-power within the Westinghouse industry and the establishment of a system for rating employees have required much individual work and concentration over a considerable period of time.

The first two problems confronted in connection with this work were:-

1. The determining of the human qualities upon which the worker was to be graded.

2. Determining the method and manner of grading these qualities.

Before determining the number of human qualities that were to be graded, the decision was made to have a system of grading on the percentage scale, such that as ideal employee would have a grade of 100%. The individual details involved in selecting the various human qualities will not be related here, as they have no bearing on the final selections made, which we are primarily interested in.

Five major qualifying terms were ultimately chosen, each one having as near as practically possible, the same relative weight or measure as regards the employee's use to the industry. Thus, under the tentative system of grading, each one of these would receive 20% as a maximum grade or one-fifth of the total grade that would be received by an ideal or perfect employee. The five factors selected upon which the employee was to be graded concerning

his value to the industry, were:- Performance, Physical Qualities, Intelligence, Executive Ability, and Miscellaneous.

For the purpose of further analyzing the worker and also for the purpose of making a more easy and uniform system of grading, each one of these major items were subdivided into four qualifying terms, each subdivision having the same relative weight or grade as regards the employee's value to the industry. Twenty subdivisional qualities had thus been determined, upon which each individual employee was to be graded. On a 100% basis each one of these qualities would be graded as 5%.

The following list gives the final selection made:

1.Performance

Accuracy
Carefulness
Knowledge
Speed

2.Physical Qualities

Activity
Health
Physique
Strength

3.Intelligence

Judgment
Resourcefulness
Self Expression
Teachableness

4.Executive

Initiative
Leadership
Self-Control
Tact

5.Miscellaneous

Conduct
Dependability
Industry
Thoroughness

When rating an employee, each of the following qualities were considered separately:-

1.Performance.

(Accuracy) Is the employee accurate? Can he use micrometers and work to thousandths of an inch?

(Carefulness) Does the employee exercise care in his work? Does he take pains with his work? Is he conscientious?

(Knowledge) Does the employee have the knowledge concerning his work that qualifies him for the work he is doing?

(Speed) How does his rate of production compare with the average for his kind of work?

2.Physical Qualities

(Activity) Is the employee active? Does he move around and cover the ground that is expected of him?

(Health) What is his condition of health? Does he have the endurance necessary to do his work? Is his health affected by the work he is doing?

(Physique) Does he have a large or small physique for the type of work he is doing?

(Strength) Is the employee strong? Can he do heavy lifting and work that requires great strength?

3.Intelligence

(Judgment) Does the employee exercise judgment in his work? Can his opinion be relied upon?

(Resourcefulness) Is he resourceful and to what extent?

(Self Expression) Does he have difficulty in expressing himself? Can he make himself easily understtod?

(Teachableness) Is he easily taught? Does he have difficulty in learning? Has he a good memory?

4.Executive.

(Initiative) Does he possess initiative? Does he plan his work?

(Leadership) Is he a leader? Is he an organizer? Does he exercise forethought? Does he have the qualities that would make a good foreman?

(Self-Control) Can he control himself? Does he get along with his fellow workers?

(Tact) Is he tactful? Is he the type of man that you like to work for? Does he have a pleasing personality? Can he analyze human nature?

5.Miscellaneous.

(Conduct) What is his conduct? What kind of an example does he set? How does he treat his fellow workmen?

(Dependability) Can he be depended upon? Is he reliable? Does he do his work just as well without supervision as he does when supervised?

(Industry) Is he industrious, progressive and always pushing things?

(Thoroughness) Is he thorough in his work? Is he s specific? Does he overlook any details regarding his work?

As the foreman is the only person that comes into daily personal contact with the workers, he is the one that knows the various characteristics of the employees under him. Therefore he is the man best fitted to do the grading and rating of his employees. In order to obtain a fair rating of each individual employee, the method of grading had to be such that it would be easily understood by the average shop foreman.

The system of grading decided upon was sort of a sliding scale method. The maximum grade that would be possible for an employee to receive was 100% and the minimum grade possible was 20%. Of course such extreme cases would probably never occur.

If an employee's maximum rating was 100%, he would have received a grade of 5% for each of the twenty qualities upon which he was graded. If his rating was 20%

he would have received a grade of 1% for each of the twenty qualities.

The method of grading was thus easily established, the following method being used. The employees rating best on any particular quality would receive a grade of 5%, the poorest employees would receive a grade of 1%, and the average employees would receive a grade of 3%. Employees whose rating on any particular quality was between the best and the average would receive a grade of 4% on that quality, and those, whose rating was between the poorest and the average would receive a grade of 2%. A worker's total grade or rating would be between 20% and 100%. This system of grading was one which the average shop foreman could use and apply intelligently.

A 4"x6" Service Record Card (Page 25) was designed for the recording and compilation of this grading. This card was designed with the idea of showing an employee's complete individual record over a period of two years, the grading to be made at 6 month intervals. A comparison of the employee's change in efficiency or value can thus be obtained for the two year period. The Service Record Card also shows the employee's occupation and classification, together with his earned rate per month, over the period during which the rating was made. The employee's attendance record together with other miscellaneous information was also recorded on the card. This system furnishes a compact method of keeping the individual record of each employee.

A technical trained man checks up this system periodically to see that the foremen are co-operating in keeping the rating of their employees up-to-date. He also acts in an advisory capacity and assists the foremen with any difficulty that they may be having.

Serial No.____ SERVICE RECORD--WORKS EMPLOYEE Form No.____

Name in Full | Address in Pencil

Country of Birth | Date of Birth | U.S. Citizen | Dependents | Date Last Employed

| Date of Rating | | |

	19___				19___			
	Earned Rate on Contract Work	Earned Rate for Month	Hours Lost	Times Late	Earned Rate on Contract Work	Earned Rate for Month	Hours Lost	Times Late
Jan.								
Feb.								
Mar.								
Apr.								
May								
June								
July								
Aug.								
Sept.								
Oct.								
Nov.								
Dec.								
Remarks.								

Reverse Side (Service Record Card)

Results of Personnel Work

The benefits that have been derived from the various phases of personnel work have been invaluable to the Company and the ultimate results obtained will be more clearly seen as time progresses. The beneficial results already obtained are most clearly shown by some comparisons of yearly labor turnover. During the year 1919 the labor turnover was only 84% as compared with an average labor turnover approximating 150% among other similar large concerns during the same period. This statement is made more forcible by the fact that this 84% labor turnover included all employees who were laid off from work because of depressive conditions during the spring of 1919. For several years preceding 1919 the yearly labor turnover at the Westinghouse factory had been approximately 150% which compared favorably with that of other large industries for the corresponding period.

What this decrease in labor turnover alone meant to the Company can best be estimated from the fact that the estimated cost to the Company of hiring and training a new employee is between $25.00 and $100.00. Assuming that the Company maintains an average payroll of 15,000 operatives, then 1% of the working force would be 150 employees. A decrease of only 1% in the yearly labor turnover would then save the Company between $3750.00 and $15,000.00. This saving in the cost of hiring and training new employees mounts very rapidly into tens of thousands of dollars as the percentage in yearly labor turnover is materially decreased.

(Note**) Labor turnover is always expressed on a yearly basis. The percentage of yearly labor turnover is obtained by dividing the number of employees who quit during the year by the average number of employees on the payroll throughout the year. For example, if the average working force throughout the year is 15,000 and a total of 22,500 leave the employ of the Company during the year, then the yearly labor turnover is $\frac{22,500}{15,000}$

or 150%

The special phases of personnel work as described herein have not only been a great factor in maintaining an intact working force, but they have been instrumental in creating loyalty and good feeling toward the Management. The employees apply themselves to their work with greater earnestness, because they know they are being rated according to their true value, and that there are well-defined methods of promotion ahead of them. Such a feeling among the workers has done more toward furthering increased production than all other agencies combined.

Some of the most important beneficial results that have thus far been obtained may be briefly summarized as follows:

1. Classification of workers according to their value to the industry.

2. Standard rates of pay depending upon the classification of the worker.

3. Uniform pay for uniform service.

4. Job specification cards to use for proper selection of workers.

5. Periodically rating of employees.

6. Asystem for facilitating the promotion of employees.

The success of Personnel Work in the Westinghouse Industry has resulted from the fundamental principle of treating the workers as industrial units in the Organization, as contrasted to the old idea of handling workers as a class. The future possibilities of Personnel Work are unlimited and even greater results are looked forward to as the employers begin to realize more and more the place of the worker in industry.